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Education in a Technological Era: The EU Digital Agenda Policy - more optimistic than realistic?

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Knowledge Management Symposium Dublin Castle

26th & 27th March 2015

Education in a Technological Era: The EU Digital Agenda policy - more optimistic than realistic?

Paper presented at Knowledge Cafe

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Abstract

Both the potential opportunities and risks for higher education providers in the digital education space are enormous. The EU in its policy paper *The Digital Agenda for Europe* (2010) sets out *interalia* targets for the development of the digital economy.

This paper examines *The Digital Agenda for Europe* (2010), focusing on Pillar VI: Enhancing digital literacy, skills & inclusion. The growth of massive open on-line courses (MOOCs) in particular have generated a lot of interest in digital education. This paper takes a broad look at the digital arena, the aforementioned Digital Agenda for Europe and other key reports on the topic.

Key words: digital literacy; inclusion; online business; elearning; digital targets; flipped classroom

Introduction

This paper examines the EU policy – *The Digital Agenda for Europe* (2010).

The rationale for the development of this particular policy is set out. This is followed by an outline of the underpinning policy focusing on Pillar VI: Enhancing digital literacy, skills & inclusion, which is of particular relevance to the higher education (H.E.) sector.

Next some key studies such as the EU Commission report (2014), European Universities Association report (2013), and the League of European Research Universities report (2014) will be discussed in relation to the views of key players on digital education.

The next section looks at some of the challenges for H. E. in dealing with digital education. The penultimate section highlights the views of the Irish business community as reflected in a recent Forfás (2013) report on the likely trajectory of digital developments.

Concluding comments are offered focusing on the digital landscape in the context of education and changing user profiles.

Rationale for development of *The Digital Agenda for Europe*

The EU Commission recognises that technology is a major driver of change. The digital economy is currently growing at seven times the rate of the rest of the economy across the EU (Digital Agenda for Europe, 2010). The growth of digital technologies such as social media and cloud computing are creating revolutionary change. This has been compared to the changes wrought by the arrival of electricity and transportation networks a century ago.

The arrival of digital technologies has also been responsible for disruptive change. Two of these are worth pointing out. Firstly, the arrival of digital technologies had changed the nature of the customer-business interface. Digital technologies allow customers to provide immediate feedback to business by means of social media and thereby influence business. Secondly, they have led to a radical overhaul of business models in some sectors e.g., travel agents, music stores, banks, book shops. At the same time they have facilitated the creation of new opportunities. The convergence of technologies is creating new product / services at an unprecedented rate. For example in the music area, technology has driven radical change: the album, then CD, and now Spotify and music streaming.

The EU Commission is aware that Europe is lagging behind other zones in terms of some key areas to support digital technologies. The *Digital Agenda for Europe* aims to ensure that the EU can compete effectively in a globalised hyper-competitive environment. It aims to improve employment and life-style opportunities for citizens.

Outline of *The Digital Agenda for Europe*

The Digital Agenda for Europe was launched in 2010. An ambitious series of targets were set to be achieved by 2020. The policy paper has seven pillars with objectives set for each. The pillars focus on the following – achieving a digital single market; interoperability and standards; trust and security; fast internet access; research and development; ICT enabled benefits; and enhancing digital literacy, skills & inclusion.

Some of the targets include: fast broadband coverage for all citizens; one third of small businesses selling on-line; half the population buying on-line; and half the population using eGovernment. Fig. 1 below depicts the position with regard to the targets at the end of 2012.

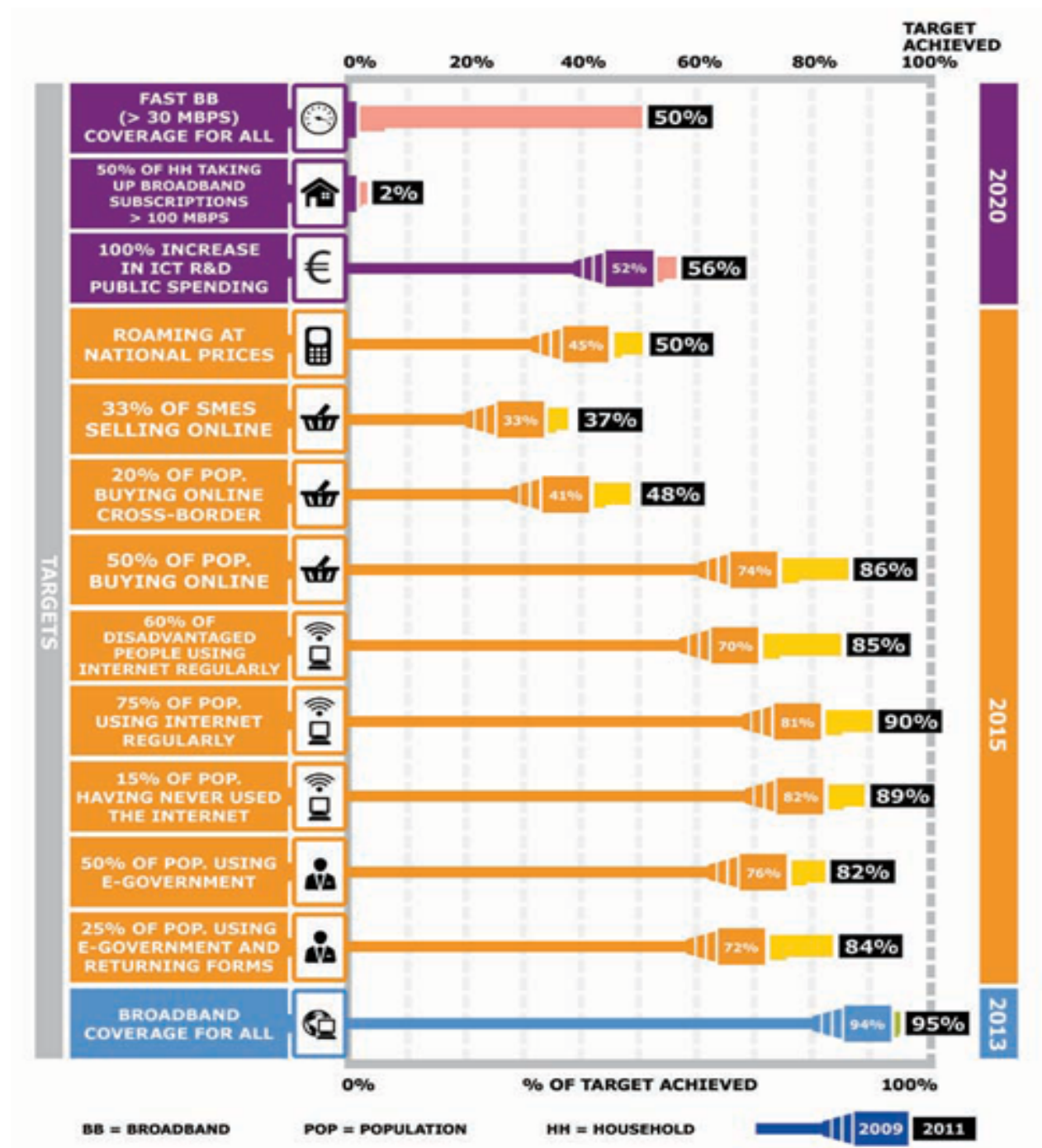


Figure 1: Digital Agenda 'Scoreboard' at the end of 2012 (Digital agenda scoreboard at the end of 2012 (n.d.).

A further review at the end of 2014 shows that on-going progress was patchy (JRC – IPTS estimate based on Eurostat, 2014). Some areas were growing quickly, including internet usage (72% of population) and on-line shopping (47% of population). However, the number of small and medium sized enterprises (SMEs) selling on-line was disappointing at 14%. The challenge of setting up a platform and payment and delivery mechanisms were identified as inhibitors for SMEs.

eGovernment is also progressing slowly and even going into reverse in some EU states. In this regard issues of confidentiality and trust are becoming more prominent in the minds of citizens for example, the question over the demand for personal public service (PPS) numbers to register with Irish Water was one of the concerns raised recently.

The Digital Agenda developed a ‘to-do’ list of digital priorities for 2013-2014 (Digital "to-do" list: new digital priorities for 2013-2014) (2012).

It consisted of seven pillars which are listed below.

- Pillar I: Digital Single Market
- Pillar II: Interoperability & Standards
- Pillar III: Trust & Security
- Pillar IV: Fast and ultra-fast Internet access
- Pillar V: Research and innovation
- **Pillar VI: Enhancing digital literacy, skills and inclusion**
- Pillar VII: ICT-enabled benefits for EU society

For the purposes of this paper the focus is on key points from Pillar VI: Enhancing digital literacy, skills and inclusion. Rubble & Bailey, (2007, p. 21) define digital literacy as “The capability to use digital technology and knowing when and how to use it” (see appendix 1 for examples of digital literacy). Digital literacy is of increasing importance for many everyday tasks from applying for jobs, to booking tickets, to completing eGovernment forms. This pillar identified the role of digital technologies in the empowerment and emancipation of citizens. Pillar VI recognises digital competence as one of eight key competencies in a knowledge society (Official Journal of the European Union, 2006) (See appendix 2 for full list).

An examination of the level of progress regarding *The Digital Agenda* (European Commission, Digital Inclusion and Skills, (n.d.) depicts the following position regarding progress of the EU in respect of digital competencies at the end of 2014:

- 47% of the EU population has insufficient digital skills, 23% has none at all.
- The number of non-internet users continues its gradual downward trend and big improvements have been made in some countries with large rates of non-users.
- 20% of the EU population has still never used the internet.
- 64% of disadvantaged people (aged 55-74, low educated or unemployed, retired or inactive) have an insufficient level of digital skills - 38% have no digital skills.
- 72% of EU population uses the internet weekly and 57% of disadvantaged do so. Most of EU population (62%) uses the internet every day.
- 39% of the EU workforce has insufficient digital skills - 14% has no digital skills at all.
- On average ICT specialist employment has grown over 4% per year since 2000, seven times higher than the total employment growth over the same period.

Higher Education in the context of digital developments

The recent focus on MOOCs gives the impression that digital technology is relatively new in HE. However, as pointed out by a recent report of the League of European Research Universities (Mapstone, 2014) educational institutions have engaged with digital technology for the past twenty years. A useful definition of digital and online learning is provided in the report:

...online learning .. is a broad spectrum of digital activity... at one end virtual learning environment(s) including handouts, digitised texts, and links to external online resources such as videos and talks. At the other end are ... MOOCs” (p. 3).

Notwithstanding the above definition which illustrates the breath of activity included in digital and online learning (with most, if not all, educational institutions involved at some level) the EU and educational institutions are aware of the speed of change and the necessity to enhance developments in this sphere. The EU identified the development of a digital strategy as one of its key actions in Horizon 2020. A High Level group chaired by Mary

McAleese, former President of Ireland, was tasked with examining H. E. in the context of digital developments (McAleese, 2014). This strategy is explored next.

The linkage between digital technologies and higher education is clearly articulated by McAleese in the *The Report to the European Commission on New Modes of Learning and Teaching in higher education* (2014). The report sets out the current level of development regarding technology in H. E., examines how technology can improve H. E., and looks at the challenges ahead and provides a series of recommendations.

McAleese (2014, p. 34) argues that Europe's institutions and Governments are resistant to change and slow to adopt new technologies. The model of students physically attending lectures which are highly customised to particular cohorts is the dominant paradigm. In the opening remarks to the report McAleese (2014, p. 4) notes that she and her colleague, Neelie Kroes, Commission Vice-President for the Digital Agenda, initiated a programme to support learning and teaching with new technologies called *Opening Up Education* in 2013. *Opening Up Education* aims to support and facilitate the use of digital technologies in the classroom using Open Educational Resources (OER). The EU commissions states that one of its objectives is to make courses developed under the support of Erasmus+ available to the public. Sharing of digital content (MOOCs) and dialogue between educators is enabled through the web site (Open Education Europa, (n.d.)). As of September 2014 there are 770 MOOCs on the site with three of these from Ireland. Appendix 3 shows the breakdown of MOOC by subject and also numbers of EU versus non-EU MOOCs. The diagram shows that the number of MOOCs per subject is uneven with science and technology having the highest number and arts the lowest. A possible explanation is that 'hard' subjects lend themselves more to on-line delivery. Appendix 3 also depicts the growth of MOOCs in European and non-European countries in 2014.

McAleese (2014) reports that despite all the hype regarding digital technology in education both Institutions and Governments do not have clear policies, targets and underpinning financial and other supports to move technology forward in a coherent and planned manner. At the same time she warns that if structures / supports are not put in place the danger is that change will happen anyway but in a very unplanned and haphazard way.

The McAleese report also looks at how technology can improve H. E. It sets out a number of possibilities including the provision of core lecture content through video, followed by smaller face-to-face tutorials. This is essentially the 'flipped classroom' model which is

defined by Butt (2014, p. 33) as follows “At the heart of the flipped classroom is moving the ‘delivery’ of material outside of formal class time and using formal class time for students to undertake collaborative and interactive activities relevant to that material.”

Such a model, while challenging to introduce, would help to address the dual pressures of increasing student numbers and reduced funding. The report notes that the model would also change the nature of teaching to more of a facilitator role. The model is explored further later in this paper in the context of the flipped classroom. The model is also interesting in conjunction with the following extract from the McAleese report: “*The goal should be to ensure that all publicly funded education resources are openly available.*” McAleese (2014, p. 10). One of the aims of the *Opening Up Education* framework is to achieve that goal.

A more positive picture of the elearning¹ landscape is presented in a recent European University Association (EUA) report by Gaebel, Kupriyanova and Colucci (2013). A survey of the EUA’s institutional members resulted in responses from 249 higher education institutions - almost one third of the total EUA membership. As such it provides a reasonable picture of the extent of elearning across the sector. The survey sought to ascertain *inter alia* the type and extent of elearning in use. The survey found that almost all the respondent institutions are involved in elearning to greater or lesser extents. Most of the institutions provided blended learning (91%) and some offer on-line learning (82%). About half reported institute-wide implementation of elearning.

Challenges for Higher Education as it adopts new technology

The importance of continuous professional development (CPD) for educators is identified in the McAleese (2014) report with a recommendation that digital skills be included in initial teacher education as well as in CPD provision. Adequate funding is a pre-requisite if technology is to be incorporated into higher education on a significant scale. McAleese (2014, p. 35) recommends that national funding models include incentives to encourage flexible modes of educational delivery.

¹ The term e-learning in the EUA (2013) survey is a generic expression for all learning involving the use of information and communication technologies (ICT) to support both learning and teaching. Its meaning here, therefore, is normally synonymous with ICT-based learning. The term may refer to the use of various technologies and tools to support learning in different contexts, including face-to-face settings and distance learning, separately or in combination, in which case e-learning is usually called blended learning.

Data is now emerging on the costs and other factors regarding MOOCs. A report by Hollands and Tirthali (2014, p. 7) sheds interesting light on MOOCs. In summary, they conducted a survey of 62 Institutions, mostly North American and Canadian. A number of aspects of the report are detailed below. They found that the rationale for introducing MOOCs varied. Six major goals were identified: extending the reach of the institution and access to education; building and maintaining brand; improving economics by lowering costs or increasing revenues; improving educational outcomes for both MOOC participants and on-campus students; innovation in teaching and learning; and conducting research on teaching and learning.

Both the financial and staff resources required to develop MOOCs are substantial. Even when materials are developed, the process of delivery is usually highly labour intensive involving on-line tutorials, chat rooms etc., so that initial set up costs can only be slowly amortized. Hollands and Tirthali provide examples of the development costs of MOOC as listed below (2014, p. 12):

- High quality video production \$4,300 per hour of finished video.
- \$38,980 for an eight week MOOC – Teachers College, Columbia University
- \$65,800 – \$71,800 for a twelve week MOOC – University of Manitoba.

Hollands and Tirthali offer some views on possible trajectories for MOOCs or their off-spring. They note that workers and employers may support some type of MOOC delivery in the future due to its flexibility of learning regarding time and place. As resource data-bases increase (through OER and Opening Up Education initiative discussed earlier) opportunities for synergies will increase allowing reduction in set-up costs. New suppliers will emerge offering unbundled courses. If these are of sufficient quality and achieve traction in the market place they will sell as niche educational services.

Similar to McAleese (2014), the EUA (Mapstone, 2014, p. 8) notes: “The inconsistent and patchy implementation of e-learning throughout the institution could be seen as a cautious exploration...” As discussed previously, as the staffing and financial resources required to implement a comprehensive digital and elearning strategy are considerable, it is understandable that institutions move slowly in this new terrain. Surprisingly the EUA

survey found that half the respondents are unconvinced that elearning improves the learning and teaching experience (2014, p. 9). It is also noteworthy that 45% of respondents were not sure of the benefits of the flipped classroom (2014, p. 9).

The Flipped Learning Network distinguishes between flipped learning and the flipped-class room. They state:

Flipped Learning is a pedagogical approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter (Flip learning (n.d.))

They note that while many academics engage in aspects of the flipped classroom requiring students to undertake certain exercises before class, flipped learning is more structured.

Prior to commencing this paper I had considered that a key benefit of using digital technologies was to enable flipped learning. However the EUA report casts these benefits in some doubt. The League of European Research Universities report (Mapstone, 2014) argues that it does not see digital technology as bringing revolutionary change to H.E., while at the same time noting it is a possibility. The report states that “it took Twitter nine months to reach ... 50 million users, something that took radio 38 years” (Mapstone, 2014, p. 4). In a wide ranging report they recommend that institutions take a strategic stance to all things digital and utilise scenario planning to incorporate digital elements into learning. The report states:

A major risk for universities is that they become strategically led by what digital technology can do, rather than requiring digital technology to enhance their educational and research missions within a defined academic strategy (Mapstone, 2014, p. 4).

A Business Perspective

Forecasting the likely scale and trajectory of digital technologies is of strategic importance for the Irish Government and for business. The Forfás (2013) report *Addressing Future Demand for High-Level ICT Skills* attempts to do this. The report undertook extensive research with key stakeholders. It notes that the arrival of the Third Platform² is expected to herald the arrival of disruptive change. The Third Platform will encompass the following elements (Forfás 2013, p. 6):

- The penetration of cloud computing will facilitate a disruptive delivery model for IT software and services;
- The internet of things will allow machine to machine connections;
- Exponential growth of Big Data driven by the increase in mobile digital devices;
- Incorporation of Social technologies by business transforming the customer – business relationship with resulting impact on supply chains.

Forfás argues that it is likely that the above developments in conjunction with changed user behaviour will have a profound impact on how business is conducted. Generation X (born between 1980 and 2000) are highly literate digital users/consumers who will relate to technology in a very different way to older users. Their view of how to obtain information and knowledge is framed against a background of ‘googling it’ as a first step when they have a question.

They are thus open to a different type of learning environment and relate easily to technology. The new digital technologies allow students to more easily take up positions as prosumers (both consumer and producer) of learning. This move to students being co-partners in learning is especially relevant for higher education where the pace and extent of change in disciplines is making it difficult for the educator to be at the forefront of knowledge in each of the sub-domains of their subject.

Concluding Comments

The speed and increased capacity of technology will open up space for new providers and mechanisms for educational provision. Similar to what has happened in other business sectors, new business models will emerge over time. In conjunction with the foregoing, the

² Third Platform – this commonly includes mobile computing, social media, cloud computing, and big data. The Internet of Things is sometimes included.

twin pressures of increased student numbers and dwindling public finances will drive new EU and local Government policies whereby Institutions will have to adopt new technologies to cope with the pressures. While the recent fanfare over the arrival of MOOCs has calmed down we are still at the early stages of its development.

The scoreboard in Figure 1 raises some interesting challenges and opportunities for the education sector in the context of EU policy. The fact that almost a quarter of the EU population have no digital skills provides an opportunity to encourage such individuals to engage with education – perhaps by way of ‘taster’ or ‘drop-in’ sessions for the local community. As was seen above almost half the EU population has insufficient digital skills. Again there are opportunities here.

The fact that 39% of the EU workforce has insufficient digital skills is significant. As was noted in the introduction to this paper, business models are changing with more and more services provided digitally. Meeting the challenge of keeping the workforce up-dated digitally will be important for the higher education sector for a variety of reasons. This in turn impacts on ensuring that the academic staff are at the forefront in this fast evolving space.

At the same time, an early pioneer of distance learning and digital education, The Open University, is currently experiencing some problems. A recent edition of *Times Higher Education* (Parr, 19-25 February, 2015, p. 8) reported that the Open University has a £17m deficit for 2013 - 14. This is at a time when it invested heavily in *FutureLearn*, its platform for MOOC's.

As mentioned previously in this paper the educational sector must manage the opportunities and risks carefully in this rapidly evolving space. Introducing new technologies is resource intensive and still somewhat unproven in its results. The number of recent studies on the topic are an indication of the strategic importance with which it is being viewed by the EU, national Governments, the educational sector and the business sector.

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Appendix 1

Examples of digital literacy:

- Understanding how to use web browsers, search engines, email, text, wiki, blogs, Photoshop, Powerpoint, video creation/editing software, etc. to showcase learning
- Evaluating online resources for accuracy / trustworthiness of information
- Using online classes to enhance learning in the classroom
- Choosing appropriate media to showcase learning – understanding what platforms will best illustrate your message and learning to peers and educators
- Using an interactive whiteboard in the classroom for lessons and allowing students to use the interactive whiteboard on a daily basis.
- Encouraging students to use technology to showcase their learning.
- Using the web (web sites videos, music) to enhance the learning of your students.
- Students and teachers creating online content to be utilised both in and out of the classroom.

Source: Rubble & Bailey, (2007, p. 21)

Appendix 2

KEY COMPETENCES FOR LIFELONG LEARNING:

The European Parliament and council set out eight key competences:

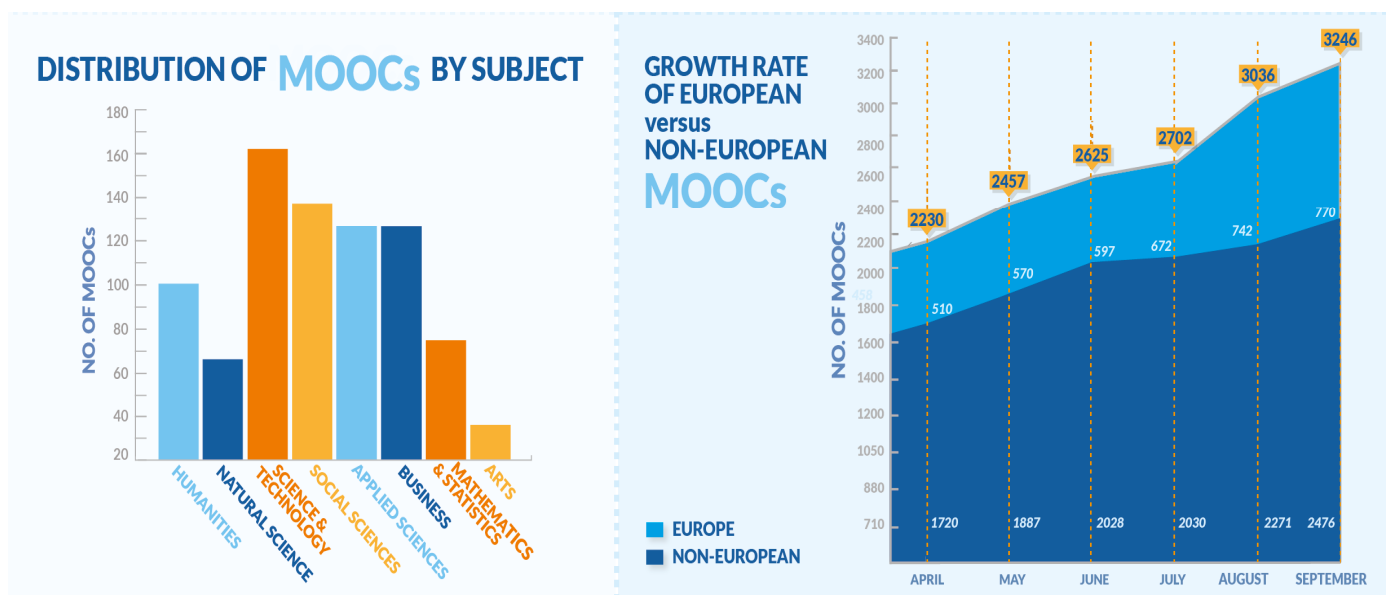
- 1) Communication in the mother tongue
- 2) Communication in foreign languages
- 3) Mathematical competence and basic competences in science and technology
- 4) Digital competence
- 5) Learning to learn
- 6) Social and civic competences
- 7) Sense of initiative and entrepreneurship
- 8) Cultural awareness and expression

Source: Official Journal of the European Union (2006), Recommendation of the European parliament and the council of 18 December 2006 on key competences for lifelong learning (2006/962/EC).

Appendix 3

Opening Up Education

Distribution of MOOCs by Subject and Growth rate of European versus Non-European MOOCs



Source: Open Education Europa (n.d.). Retrived November 10, 2014 from <http://www.openeducationeuropa.eu/en/find/moocs>